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Results of the Archbold Expeditions. No. 70 Siphonaptera from Netherlands New Guinea. Part 1

By F. G. A. M. Smit[1]

Among the more than a hundred thousand insects collected by the late Prof. L. J. Toxopeus in Netherlands New Guinea in 1938–1939, when he was attached to the Third Archbold Expedition as entomologist and leader of the Netherlands scientific party, were 119 specimens of fleas, which had been deposited in the Zoologisch Museum en Laboratorium at Buitenzorg, Java, together with all the other invertebrates collected. This collection of fleas, in 28 tubes, fortunately survived the war and revolution in Java, and it was ultimately put at my disposal through the courtesy of the Director of the Buitenzorg Museum, Dr. M. A. Lieftinck, and Dr. A. Diakonoff, at that time entomologist of the museum.

In spite of the comparatively small number of fleas obtained, the present collection is the finest and most important ever made so far in New Guinea. Twenty of the 24 species collected are new to science, doubling the number of fleas recorded from New Guinea until now, while four of them represent new genera. The total number of fleas actually occurring on that in many respects so extremely interesting island may well greatly exceed a hundred. In view of the medical importance of this group of insects and of other parasites as well, it would be very desirable that future expeditions should attach a parasitologist to their party, who could concentrate on collecting ectoparasites as well as endoparasites from the animals obtained.

The collection Toxopeus made is not only of great value because it is rich in species, but especially because of the great care he took in

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labeling all specimens. It is worth noting that the majority of these fleas were collected at altitudes (3600–3800 meters) at which only very few fleas have been collected elsewhere in the world.

The four new genera are described in this paper and also nine new species not belonging to the genus *Stivalius*. Part 2 of this report will deal only with the 11 new species of *Stivalius*.

I am greatly indebted to Dr. G. H. H. Tate for supplying the final identifications of the hosts and to Prof. F. Peus for the loan of the type of *Acanthopsylla enderleini* (Wagner).

LIST OF COLLECTING STATIONS

Fleas were collected at eight of the 17 camps where entomological collections were made; these eight camps are listed below, with some explanatory data taken from Toxopeus' List of Collecting Stations (1940).

HOLLANDIA: Coast of Humboldt Bay, near the frontier of the Mandated Territory. Open grassy areas, virgin and secondary jungle on limestone. Altitude: 0–100 meters.

LAKE HABBEMA: About 15 kilometers north of Mt. Wilhelmina. Moorland, fens, and sparse coniferous forest, furthermore the highest outposts of the high mountain moss forest. Altitudes: surface of lake at 3225 meters, surrounding hills to 3400 meters; most of materials gathered at 3250 meters.

LETTERBOX CAMP: About 4 kilometers east of Mt. Wilhelmina. Swampy alpine vegetation, at the timber line. Altitude: 3560 meters, collections made between 3500 and 3700 meters.

SCREE VALLEY CAMP: At the foot of Mt. Wilhelmina. Alpine above timber line, shrubs at sheltered spots only. Altitude: 3800 meters, where most specimens were collected.

MOSS FOREST CAMP: In high jungle a good 5 kilometers northeast from Lake Habbema. High mountain moss forest, of mainly beech trees, few conifers, thick undergrowth of orchids and ferns. At 100 meters lower down local change into richer vegetation without thick moss, due to sheltered position. Altitude: 2800 meters; some further collecting was done at 3000, 2700, and at 2600 meters in a deep ravine with much insect life owing to its open condition.

BALIM RIVER CAMP: At the southern extremity of the Grand Valley of the Balim, amid the cultivations of the Papuas, at about 30 kilometers east of Lake Habbema. No primeval forests, many grass-covered hills. Altitude: 1600 meters.

MIST CAMP: On the mountain ridge southwest of Bernhard Camp on the Idenburg River. Dense, very damp forest in a saddle. Altitude: 1800 meters.

RATTAN CAMP: In a dense jungle with many rattan palms, on a ridge sloping into the Araucaria River (a tributary of the Sahuweri River). Altitude: 1200 meters; by going down into some ravines specimens were collected to below 1100 meters.

FAMILY PULICIDAE

SUBFAMILY PULICINAE

Pulex irritans Linnaeus, 1758

Balim River Camp, altitude 1700 meters, November, 1938: two males and two females, in a tent, collected by L. J. Toxopeus; *ibid.*, altitude 1600 meters, December 11, 1938: one female, host unknown, collected by L. J. Toxopeus; December 12, 1938, one female *ex Syconycteris crassa papuana,* collected by L. J. Toxopeus. The finding of the human flea on this frugivorous bat must be considered as accidental. *Pulex irritans* was obviously not uncommon in the Balim River Camp, and the specimen caught probably got on to the bat while this was awaiting preparation.

FAMILY LEPTOPSYLLIDAE

SUBFAMILY PECTINOCTENINAE

Sigmactenus toxopeusi, new species

Figures 1–11

TYPES

Holotype male and allotype female, Letterbox Camp, altitude 3600 meters, September, 1938, *ex Neophascogale lorentzi,* collected by W. B. Richardson and L. J. Toxopeus. Holotype and allotype deposited in the collection of the Rijksmuseum van Natuurlijke Historie at Leiden, Holland. Paratypes: Two males and seven females with same data as holotype and allotype; one female *ex Rattus niobe arrogans,* Letterbox Camp, altitude 3600 meters, September 9, 1938, collected by L. J. Toxopeus; one female *ex Rattus niobe arrogans,* Lake Habbema, altitude 3250 meters, August 23, 1938, collected by W. B. Richardson and L. J. Toxopeus; one female *ex Pseudocheirus pygmaeus,* Lake Habbema, altitude 3250 meters, August 26, 1938, collected by W. B. Richardson and L. J. Toxopeus. Deposits of paratypes: one male and four females in the British Museum collection at Tring; one male and three

females in the American Museum of Natural History; three females in the collection of Lt. Col. Robert Traub, Army Medical Service Graduate School, Washington, D. C.

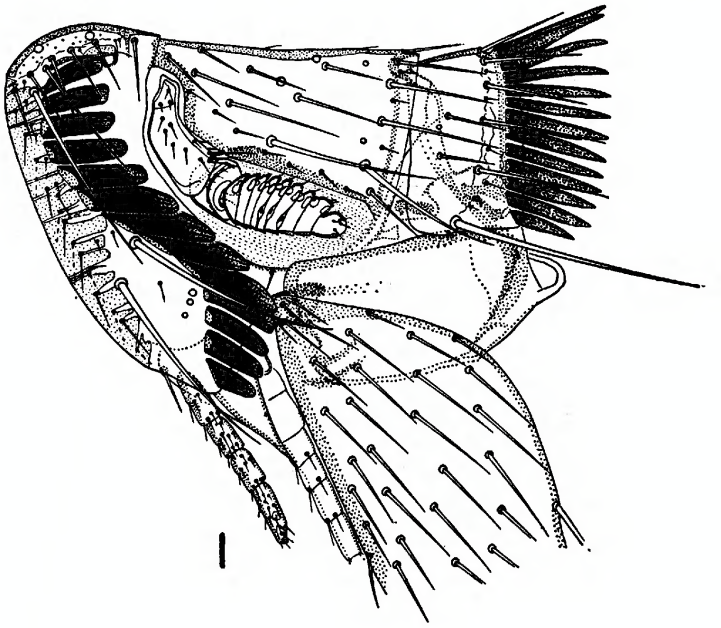
Diagnosis

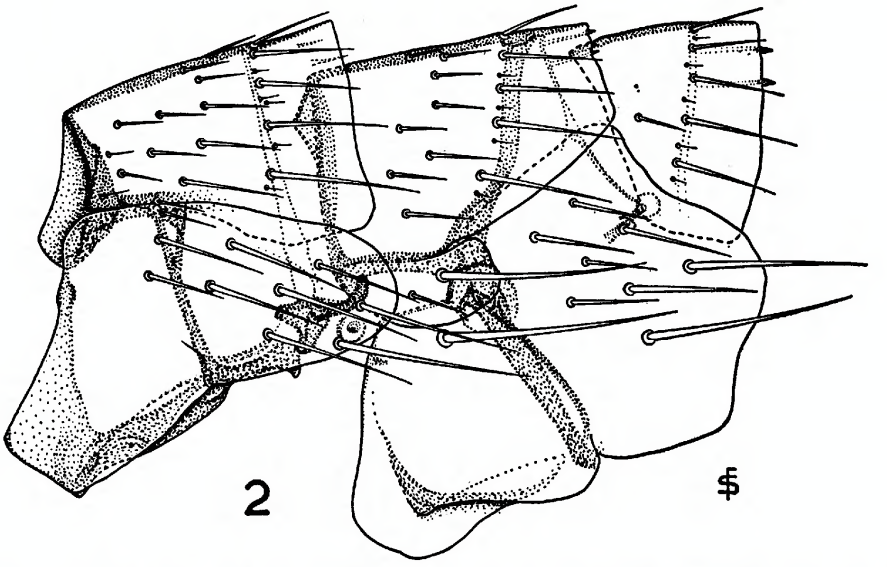
Separable from the only other known species, *Sigmactenus werneri* Traub, 1950, by the larger number of spines in the genal ctenidium (12–14 as against 7–10 in *S. werneri*); in the male by the genitalia, e.g., the movable process of the clasper bears no spiniform setae on the lower half of the posterior margin and the ninth sternum is much narrower and without an apical spiniform seta; in the female by the more numerous setae of the seventh sternum and by the shallower sinus of the posterior margin of this sternum, though the shape of this margin is very variable.

Description

Head (fig. 1): Upper half of internal incrassation of frons reaching beyond the bases of the spines of the genal ctenidium. Submarginal clypeal row consisting of nine to 12 small slender setae. Dorsal frontal row of six (sometimes seven) setae. In front of the uppermost spine of the genal comb a long seta, a smaller one above the base of this spine, inserted below the level of the second and third dorsal setae. Two long setae placed on the gena, and also several scattered minute setae. Area of micropores above the dorsal frontal row very narrow and small. Genal ctenidium forming a sigmoid curve, consisting of 12 to 13 blunt spines in the male, 14 (seldom 13 or 15 on one of the sides) in the female. Eye reduced, shifted to above the apex of the uppermost spine of the genal ctenidium. Labial palp of five segments comparatively short, reaching just beyond half of the length of the fore coxa. Scape of antenna in both sexes without a dense tuft of dorsal, marginal, and submarginal setae; setae of pedicellus minute in the male, somewhat larger in the female and in this sex one dorsal seta of the pedicellus is very well developed and reaches well beyond the clava. Antennal fossa bordered dorsally by a few minute setae, the fossa itself in the lower part minutely and densely punctulately striated. Postantennal region with four rows of setae.

Thorax (figs. 1 and 2): Pronotum with two rows of setae, the anterior row of only two setae (sometimes one or three) on each side; pronotal ctenidium of 27 spines on the two sides together in the male, and 25 to 29 (usually 27 or 28) in the female. Mesonotum each side with three rows of setae, the anterior row may be preceded by one or a few setae; with two pseudosetae dorsally under its collar and sometimes





FIGS. 1, 2. *Sigmactenus toxopeusi*, new species. 1. Head and prothorax, male; Letterbox Camp. 2. Mesothorax, metathorax, and tergum I, holotype.

a smaller one ventrally. Mesosternosome with 10 setae, arranged in four rows. Metanotum with three rows of setae and two (seldom one or three) minute spinelets on the posterior margin near the dorsum. Metepisternum with one large and one small seta, metasternum with one

large seta, metepimeron with about eight setae, the posterior ones being the largest.

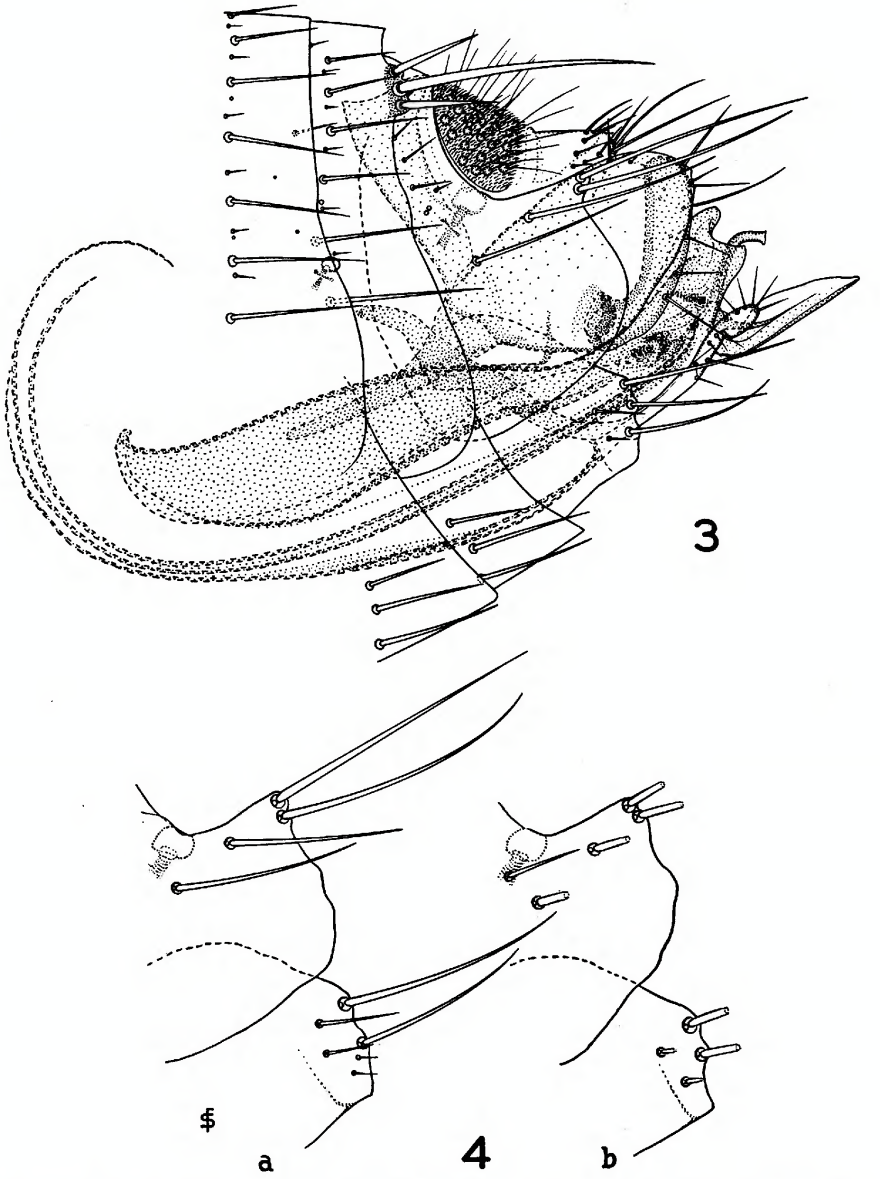
LEGS: Tibia I with a dorsolateral false comb of about nine spiniform setae (the outer one of the basal notch not included because it does not contribute to the comb-like appearance), false comb of tibia II with about 11, and that of tibia III with about 14 setae. The false combs are preceded by a submedian row of setae on the outer surface of the tibia, consisting of five to seven, four to five, and five to six setae, respectively. Length of tarsal segments in microns (petiolate base omitted in the figures in parentheses):

LEG	TARSAL SEGMENTS				
	I	II	III	IV	V
Male					
Fore	77	90(71)	75(63)	59(53)	113(104)
Mid	190	135(118)	99(80)	66(57)	118(107)
Hind	344	189(162)	126(102)	79(61)	124(116)
Female					
Fore	94	102(80)	86(69)	69(58)	116(105)
Mid	234	172(132)	112(88)	74(63)	123(116)
Hind	396	228(183)	152(127)	85(66)	128(117)

Last segment of all tarsi with four pairs of lateral plantar setae and two plantar setae between the basal pair, reaching to or extending just beyond the base of the third lateral pair.

ABDOMEN: Terga I to VII each side with two rows of setae, the anterior row in the male reduced to one or two setae or even absent, in the female consisting of two to six setae. Spinelets on posterior margin on each side of terga I to V, respectively, in the male: 2 (seldom 3), 2, 2 (sometimes 1), (seldom 2), 0 (sometimes 1); in the female: 2–3 (seldom 4), 2–3, 1–2 (seldom 3), 1 (sometimes 2, seldom 3), 0 (seldom 1). Basal sternum with usually only one ventromarginal seta each side. Sterna III to VII in the male with normally a row of three setae each side. Sterna III to VI in the female with a row of four to five setae, the row on sternum VI preceded by one or two smaller setae. Three antesensilial setae in the male, of which the middle one is two and one-half to three times as long as the outer ones, and the uppermost is usually slightly shorter than the lowest (fig. 3); in the female four antesensilial setae on one pedestal, not divided into two groups, the uppermost and the third are of subequal length, the second from above is the longest (fig. 8).

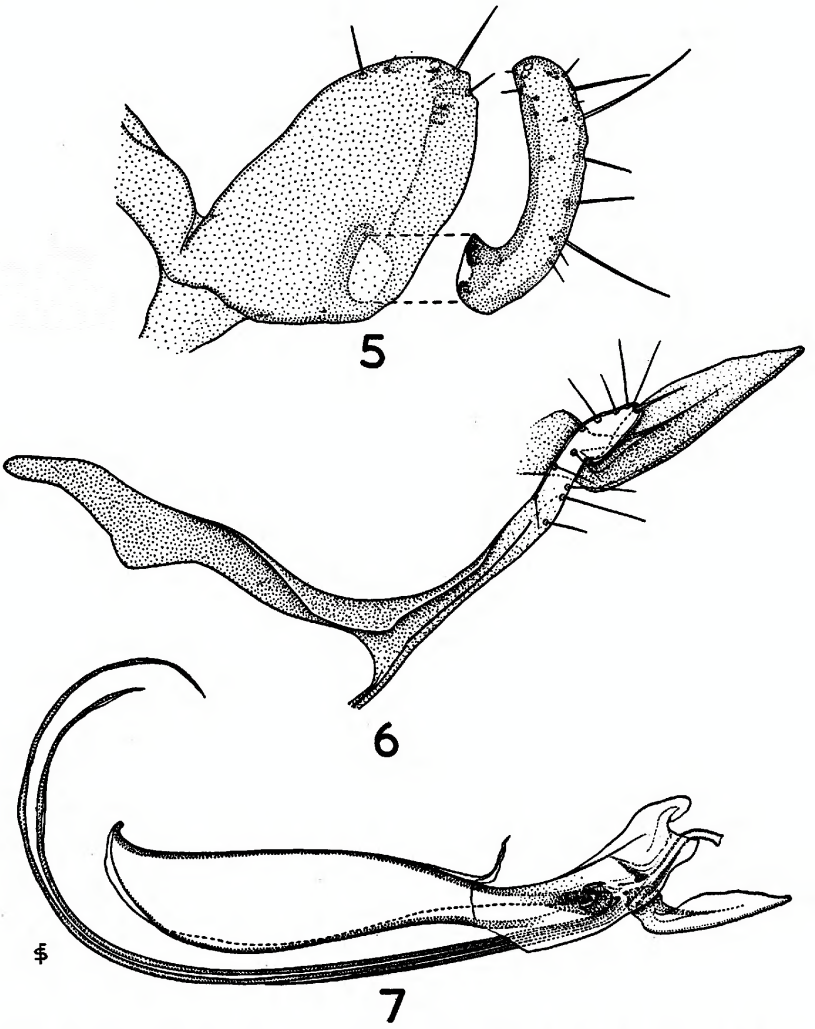
MODIFIED ABDOMINAL SEGMENTS, GENITALIA; MALE (FIGS. 3–7): Tergum VIII (figs. 3 and 4) without a spiculose area, extending backward to just beyond the middle of the clasper, its posterior margin some-



FIGS. 3, 4A–B. *Sigmactenus toxopeusi*, new species. 3. Terminalia, holotype. 4A–B. Tergum VIII and sternum VIII of two males, showing variation; Letterbox Camp.

what variable (see fig. 4) and bearing at its dorsomarginal angle only two very long setae; on the surface of this tergum below the spiracular fossa, away from the margin, are two long setae and occasionally one short one; above the spiracular fossa are three to five small setae in a vertical row. Sternum VIII (figs. 3 and 4) slightly higher than wide,

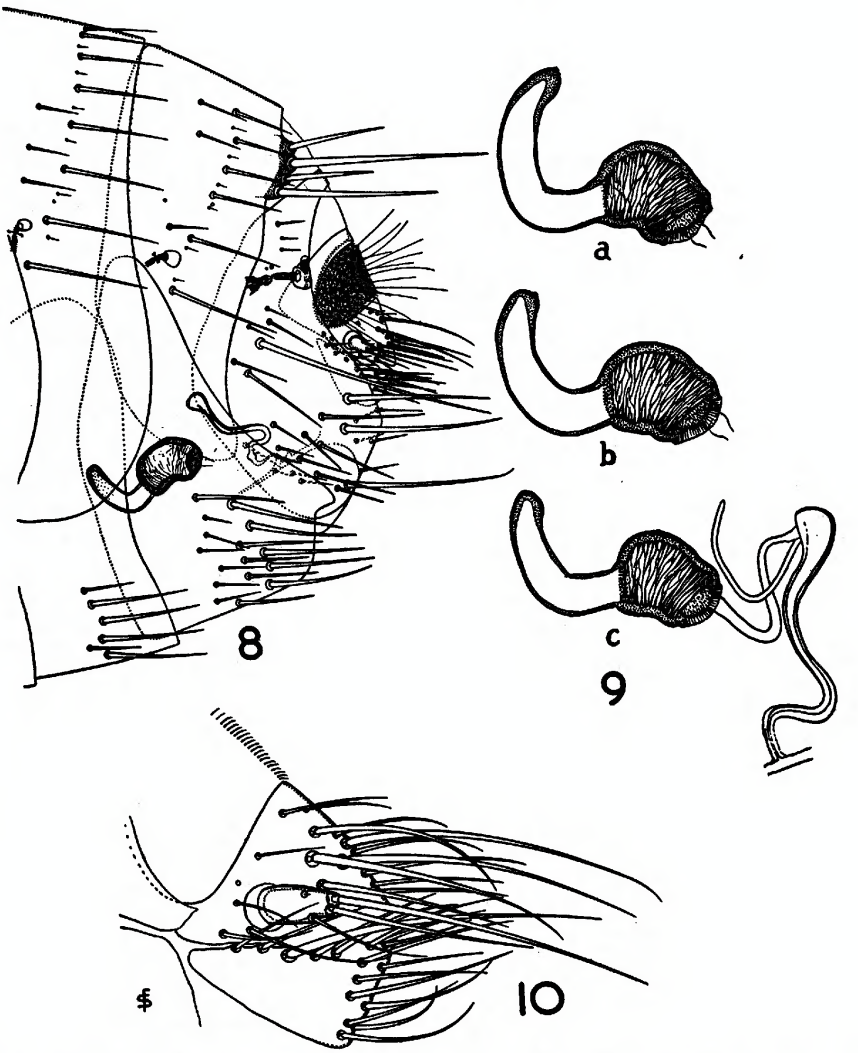
with two or three long setae on the posterior margin, anterior to which there are two short ones. Corpus of clasper (fig. 5) broad, somewhat elongated, with a rounded apex on which there are one smallish seta and another still smaller one; a few small setae along the anterior margin. Movable process of clasper (fig. 5) curved, slender, five times as



FIGS. 5–7. *Sigmactenus toxopeusi*, new species. 5. Clasper and movable process, holotype. 6. Sternum IX, holotype. 7. Phallosome, holotype.

long as its breadth at the middle, of subequal width (somewhat broadened towards the apex) and with several setae, none of which are spiniform or subspiniform, along the posterior margin. Manubrium long and narrow, straight or slightly bent upward, about four times as long as basally broad. Internal apodeme of tergum IX high and narrow, about

five times as long as its breadth at the junction with the corpus of clasper. Proximal arm of sternum IX very narrow, as is also the distal arm (fig. 6); along the dorsal margin of the latter arm towards the apex there are seven or eight longish, very slender setae and at the apex one somewhat thicker seta; margin below apex slightly bulging and suddenly narrowing; at this point there seems to be a connection with the aedeagal crochet, these structures being fixed to one another in many leptopsyllids; ventral margin with about three long slender setae. Apodemal rod of sternum IX long, making approximately one-quarter of a convolution.



FIGS. 8–10. *Sigmactenus toxopeusi*, new species. 8. Terminalia of female; Lake Habbema. 9A–B. Spermatheca, showing variation; Letterbox Camp. 9C. Spermatheca and ducti. 10. Anal segment of female; Letterbox Camp.

Aedaegal apodeme (fig. 7) long and slightly curved, with an upturned apex. Phallus tube (fig. 7) distinct and curved, its apical part turned downward and protruding. Crochet (figs. 6 and 7) long, with an undulating convex dorsal margin and an almost straight ventral margin.

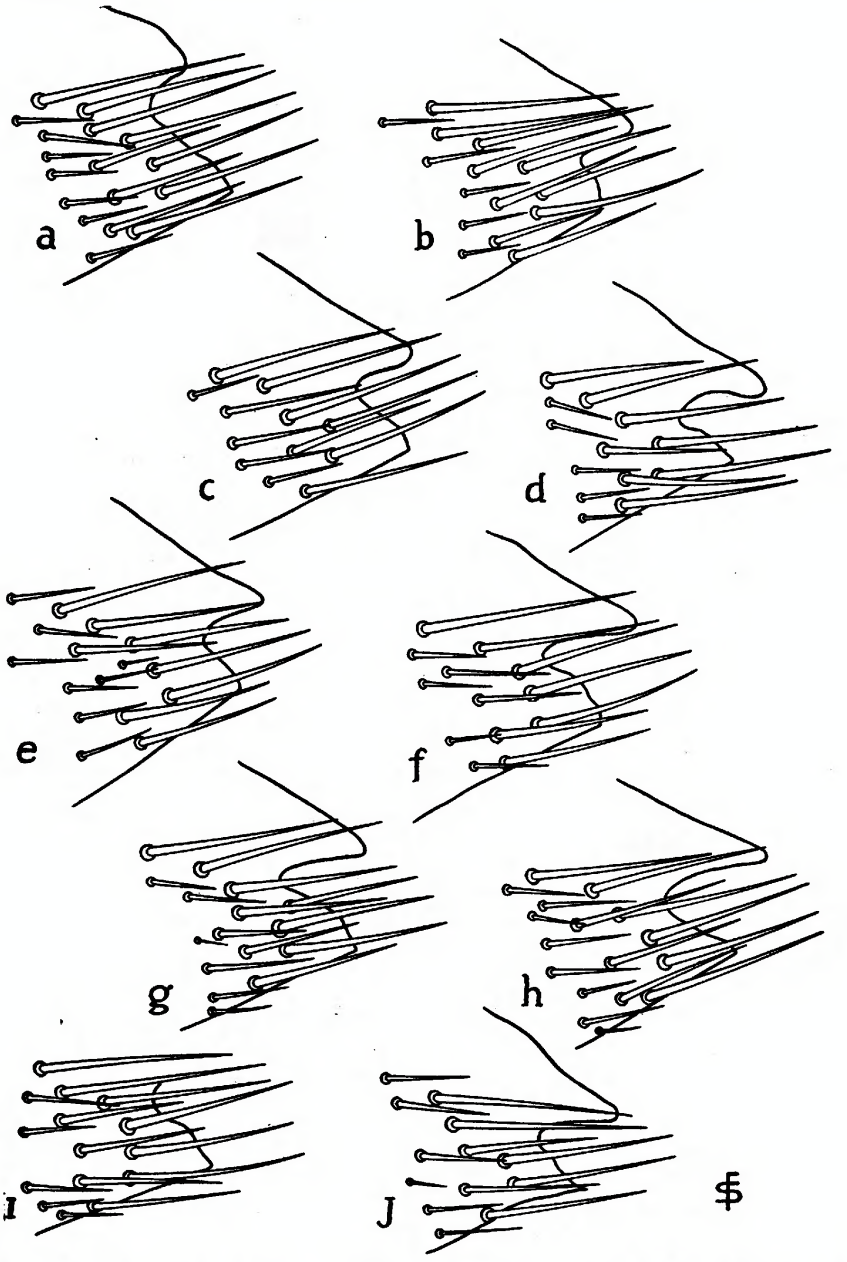


FIG. 11. *Sigmactenus toxopeusi*, new species. Sternum VII of females, to show variation. A–I from Letterbox Camp; J from Lake Habbema.

The two tendons of the phallosome make about half a convolution. Sensilium flat, about as long as broad (fig. 3).

Modified Abdominal Segments, Genitalia; Female (figs. 8–11): Posterior margin of sternum VII with a sinus which is very variable in size and depth (fig. 11) and may even be absent (fig. 8); with a posterior row of irregularly placed strong setae, preceded by two rows of thinner but also irregularly placed setae. Tergum VIII with several small setae above the spiracular fossa, one of the group of four to six setae below this fossa is extremely long; three long setae near the ventroposterior margin and several smaller ones scattered on the lower part of the sternum (fig. 8). Anal tergum (fig. 10) triangular, with many setae of which several are long; anal stylet twice as long as broad, with one or two apical and one or two subapical setae; dorsal and posterior margins of the triangular anal sternum bordered by a fringe of setae (fig. 10). Sensilium somewhat longer than wide. Ductus bursae strongly bent, ending in a pear-shaped bursa copulatrix; ductus seminalis and ductus obturatorius of subequal length, not very long (fig. 9C). Spermatheca with reservoir longer than broad, with a thick wall, a distinct cribriform area and internally striated; appendix of spermatheca longer than the reservoir, bent at approximately a right angle. (For the degree of variation in the size and shape of the spermatheca, see fig. 9A–C.)

Length of male, 1.75–2.00 mm.; of female, 2.25–2.50 mm.

Remark

This species is named in memory of Prof. L. J. Toxopeus, who will always be remembered by those who knew him as a grand man and a great entomologist.

FAMILY PYGIOPSYLLIDAE

SUBFAMILY PYGIOPSYLLINAE

Idiochaetis illustris Jordan, 1937

Moss Forest Camp, altitude 2800 meters, October 29, 1938, six males and five females *ex Hyomys goliath dammermani,* collected by W. B. Richardson and L. J. Toxopeus.

Ernestinia, new genus

Close to *Stivalius* Jordan and Rothschild. Frons without a distinct regular anterior row of setae. The straight dorsal margin of the preantennal part of the head forms anteriorly a downward-pointing hook, below which the straight frontal margin slopes backward. The whole

of the pre-antennal part of the head is covered with short, spiniform setae. Mesonotum and metanotum with three rows of setae. First and third pairs of lateral plantar setae not much shifted on to the planta. Male: Movable process of clasper dilated dorsally and ventrally at the apex; lower angle of the corpus of clasper strongly produced, with more than two setae. Female: Without stout setae below the antesensilial setae.

TYPE SPECIES: The new species described below.

I have much pleasure in naming this new genus after my wife Caroline Ernestine.

Ernestinia eximia, new species

Figures 12–20

TYPES

Holotype male and allotype female, Letterbox Camp, altitude 3700 meters, September 12, 1938, *ex Pogonomelomys rümmleri,* collected by W. B. Richardson and L. J. Toxopeus. Holotype and allotype deposited in the collection of the Rijksmuseum van Natuurlijke Historie at Leiden, Holland. Paratypes: Two males and one female with same data as holotype and allotype; one male *ex Neophascogale lorentzi,* Letterbox Camp, altitude 3600 meters, September, 1938, collected by W. B. Richardson and L. J. Toxopeus; one female *ex Pseudocheirus pygmaeus,* Letterbox Camp, altitude 3600 meters, September 13, 1938, collected by W. B. Richardson and L. J. Toxopeus; one female *ex Rattus niobe arrogans,* Scree Valley Camp, altitude 3800 meters, September 27, 1938, collected by W. B. Richardson and L. J. Toxopeus. Deposits of paratypes: Two males and one female in the British Museum collection at Tring; one male and one female in the American Museum of Natural History; one female in the collection of Lt. Col. Robert Traub, Army Medical Service Graduate School, Washington, D. C.

DIAGNOSIS

The most characteristic feature of this species (the only known representative of the genus so far) is the curious head, which is dorsally almost straight and has at the dorsal end of its anterior margin a downward-pointed sharp hook, below which the frontal margin slants backward; the setae of the head are for the greater part transformed into strongly pigmented stout spiniforms or subspiniforms.

DESCRIPTION

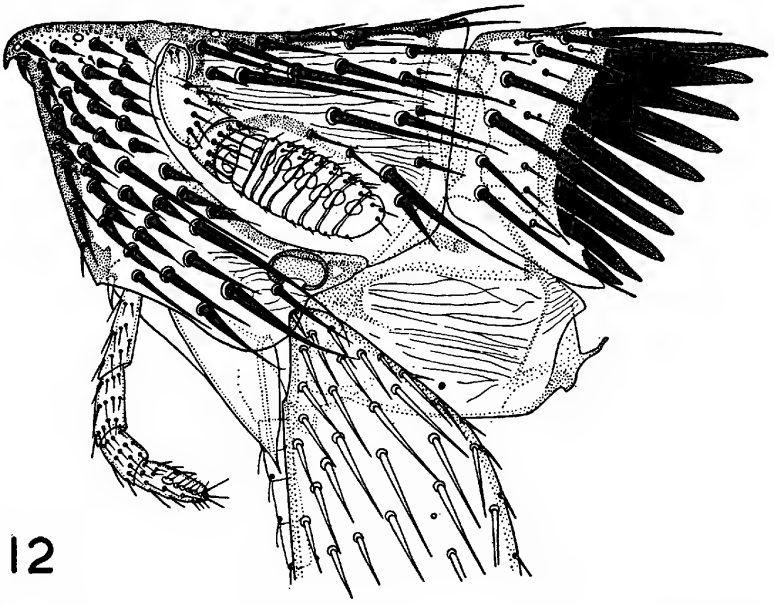
HEAD (FIG. 12): Semifracticipit. Dorsal margin of pre-antennal part straight, rounded anteriorly, and forming a usually sharply pointed

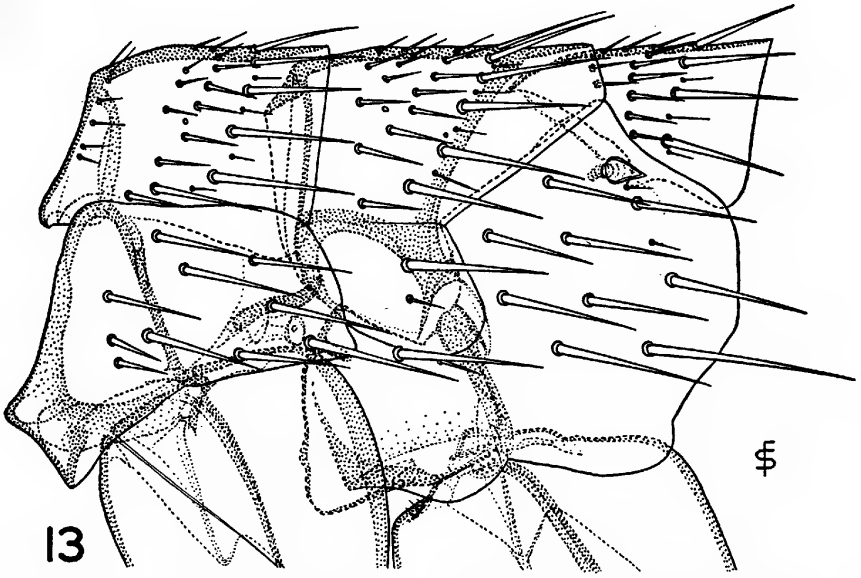
hook, below which the straight frontal margin slopes backward, forming with the dorsal margin an angle of about 75 degrees. Oral angle obtuse but sharply pointed; ventral margin of head forming a broad, nearly semicircular lobe. The frontal hook is probably homologous with a frontal tubercle, representing an excessively developed one. Internal incrassation of the frons fairly broad. Eye well developed. Almost the whole of the pre-antennal region covered with stout and dark spiniform setae which are mostly very short and form no distinct rows; one of these, in the middle of the frontal region, is long and reaches to the eye; the spiniform setae on the gena are also long. The area of micropores is extremely small and borders the dorsal margin; below this area there are a few microsetae. Stipes pointed, fairly broad, reaching to the apex of the five-segmented labial palp. Scape of antenna with several small setae, those of pedicellus not extending beyond the first segment of the clava, which is broad and tapers only a little. In the male the antennal fossa begins near the dorsal margin of the head, in the female more lower down; an interantennal suture is visible in both sexes. Post-antennal region with dorsal margin somewhat concave in the male, straight or slightly convex in the female, with four rows of subspiniform setae, the two anterior rows almost horizontal, the two posterior rows nearly vertical.

THORAX (FIGS. 12 AND 13): Pronotum with two rows of setae, the anterior row consisting of three to four small setae near the dorsal margin, while the posterior row consists of six to seven long subspiniform setae each side while the intercalary setae of this row are displaced posteriorly and appear to form a third row. Pronotal ctenidium with 20 spines in both sexes. Mesonotum with three rows of setae, apart from a row of small setae (normally covered by the spines of the pronotal ctenidium) along the anterior margin; mesosternosome with about 10 setae. Metanotum with four rows of setae, the anterior row consisting of only one or a few small setae each side; metepisternum and metasternum each with one large and one small seta; metepimeron with nine to 10 large setae, forming three vertical rows, plus two minute setae below the spiracle; pleural rod not very long.

LEGS: Hind coxa with a ventro-apical patch of small slender setae on its inner surface. All tibiae with two rows of setae on the outer lateral surface; dorsal margin of mid tibia and hind tibia with six notches, from each of which two strong setae arise, except in the second notch from the base, which in both sexes bears only one seta. Length of tarsal segments in microns (petiolate base omitted in the figures in parentheses):

Leg	Tarsal Segments				
Male	I	II	III	IV	V
Fore	96	102(86)	85(71)	69(57)	121(112)
Mid	154	141(119)	101(85)	69(58)	134(123)
Hind	300	242(201)	151(127)	93(79)	145(135)
Female					
Fore	102	115(94)	91(77)	74(63)	143(132)
Mid	176	163(140)	110(91)	75(64)	135(125)
Hind	352	272(239)	156(132)	108(97)	165(154)

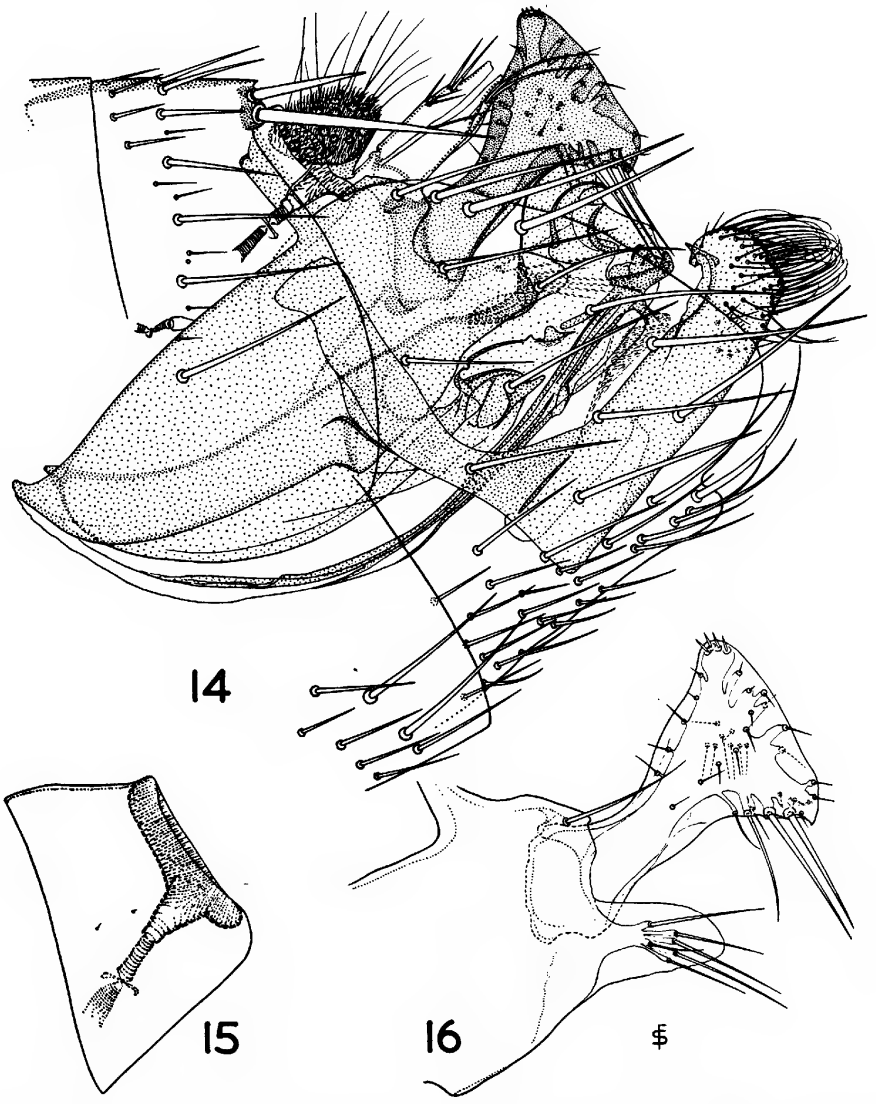




Figs. 12, 13. *Ernestinia eximia*, new species. 12. Head and prothorax, male; Letterbox Camp. 13. Mesothorax, metathorax, and tergum I, holotype.

Fifth segment of all tarsi with six pairs of lateral plantar setae, the basal three pairs shifted a little onto the planta, the remaining three pairs are lateral. In the female two pre-apical plantar setae on all fifth segments; in the male the fifth segment of the fore and mid tarsi with four pre-apical plantar setae, that of the hind tarsus with two of these setae.

ABDOMEN: Tergum I (fig. 13) with three or four rows of setae. Terga II to VI in the male with two rows; in the female these two rows are preceded by some very irregularly placed smaller setae. Tergum VII in the

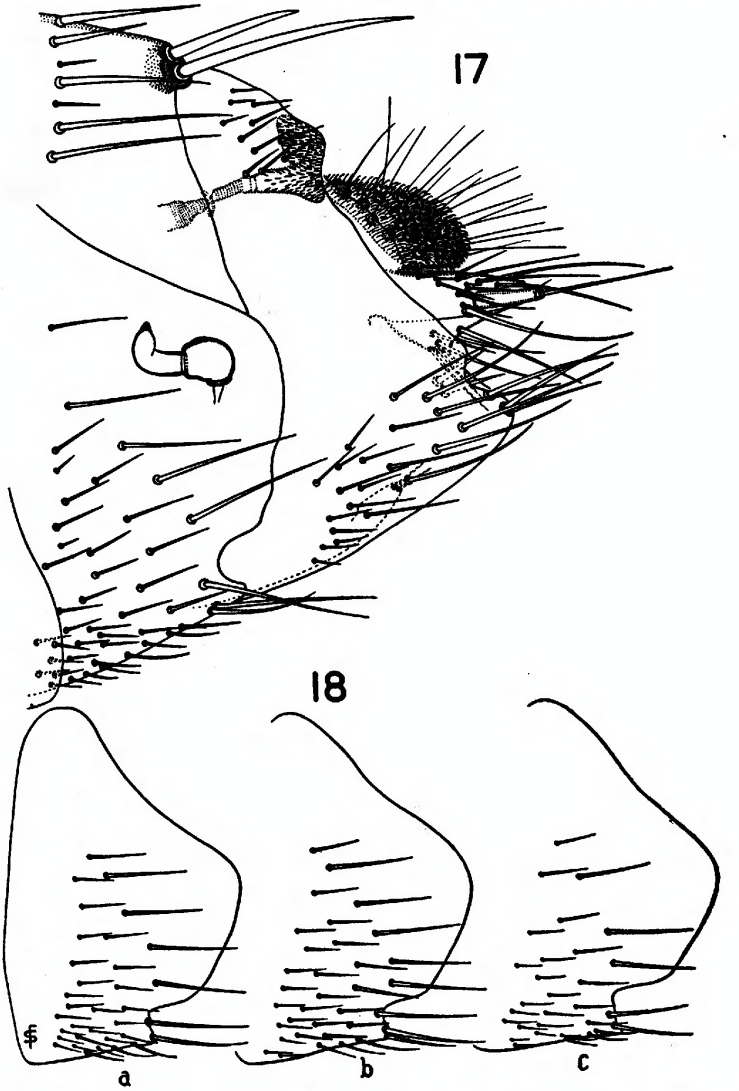


FIGS. 14–16. *Ernestinia eximia*, new species. 14. Terminalia, holotype. 15. Tergum VIII of male; Letterbox Camp. 16. Clasper and movable process; Letterbox Camp.

male with two rows of setae, and with two antesensilial setae (on each side) of which the upper is much shorter than the lower; the margin of tergum VII between the two groups of antesensilial setae forms a small triangular projection (fig. 14). In the female tergum VII bears in front of the two rows some irregularly placed setae which are more numerous than the corresponding ones on the preceding terga; the two groups of antesensilial setae are placed very close to the dorsal margin, and the margin of the tergum between them forms no distinct triangular projection (fig. 17). Terga II to V in both sexes each with one apical spinelet each side near the dorsum. Basal sternum in both sexes with a few setae along the ventral margin. Sterna III to VII of male with a main row of three (sometimes four) setae, preceded by seven or eight smaller setae forming two or three irregular rows. Sterna III to VI of female with a main row of four or five setae, which are more widely spaced and more slender than the corresponding setae in the male, and the irregularly placed smaller setae preceding them are more numerous than in the male.

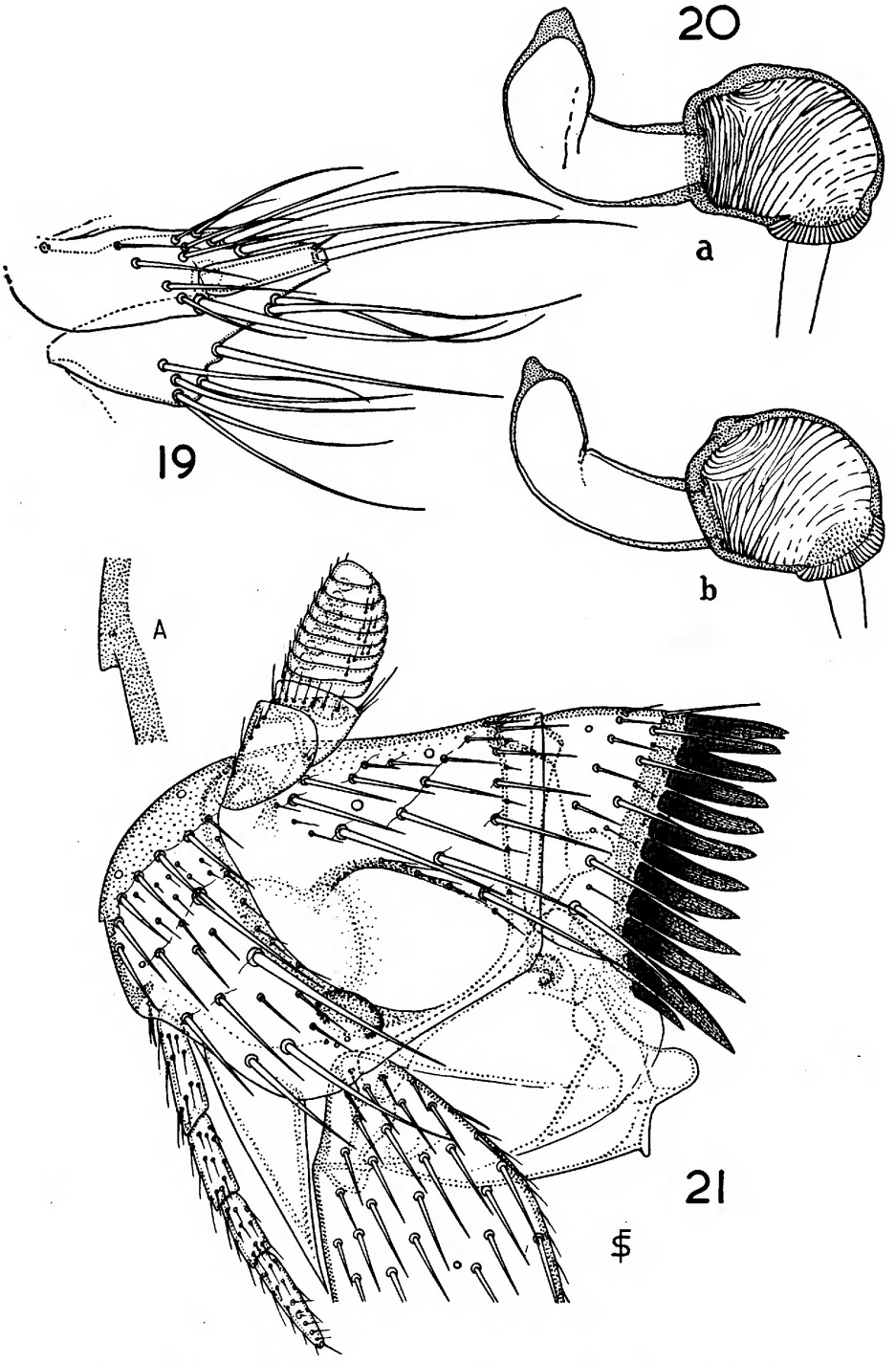
Modified Abdominal Segments, Genitalia; Male (figs. 14–16): Tergum VIII small, with at most a few minute setae (fig. 15). Sternum VIII large, its posterior margin with a sinus near the ventral angle, the lobe above the sinus rounded and large; near the dorso-apical margin four stout setae and on its surface a dozen or more setae, while smaller setae are abundant near and along the ventral margin. Corpus of clasper (fig. 16) short, bearing one seta at the upper part of the acetabulum, ventro-apically expanded into a very thin lobe, which bears about five or six slender setae. Manubrium very large and broad, while the internal apodeme of tergum IX is exceedingly narrow (fig. 14). Movable process of clasper (fig. 16) straight, expanded apically, the greater part of the apical margin almost straight; several small setae near the dorsal (anterior) and apical margins as well as a longitudinal row in the middle of the outer surface of the expanded portion and a group of about eight on the inner surface of the same part; at the dorso-apical angle three or four spindle-shaped setae, and on the apical part of the ventral (posterior) margin three strong setae preceded by one or two smaller ones. Sternum IX (fig. 14) with proximal arm only a little widened towards the apex; the distal arm much broader, straight except that the apex is a little turned upward. This arm is only setose on its apical third where (especially near or along the apical margin) there are numerous slender setae, the apices of which are more strongly curved. A few setae on the inner surface of the apical third; none of the setae of sternum IX are spiniform or subspiniform. Aedeagal apodeme reaching almost to the apex of the manubrium and slightly more than half as broad as the latter, with a concave dorsal and a convex ventral margin.

Tendons of phallosome very short, not longer than the aedeagal apodeme. (For the detailed structure of the phallosome, see fig. 14.) Sensilium of the typical pygiopsyllid structure. The tubiform anal segment is at most three times as long as broad, with subparallel margins (fig. 14).



FIGS. 17, 18A–C. *Ernestinia eximia*, new species. 17. Terminalia of female, allotype. 18. Sternum VII of females, to show variation. A from Scree Valley Camp; B and C from Letterbox Camp.

MODIFIED ABDOMINAL SEGMENTS, GENITALIA; FEMALE (FIGS. 17–20): Posterior margin of sternum VII with a shallow sinus, above which the margin forms a broad lobe which is not very variable (figs. 17 and 18A–C); the sternum with a posterior row of six to nine setae each



FIGS. 19, 20A–B. *Ernestinia eximia*, new species. 19. Anal segment of female; Scree Valley Camp. 20. Spermathecae; A from Letterbox Camp, B from Scree Valley Camp.

FIG. 21. *Traubia egregia*, new species. Head and prothorax, holotype. A. Detail of frons, showing tubercle.

side, preceded by a number of smaller setae which may form very irregular rows. Tergum VIII (fig. 17) with a fairly straight posterior margin, which forms in its lower third a shallow sinus, the lobe below which bears two strong setae; a patch of small setae above the spiracular fossa; no setae on the middle part of the tergum, but there are scattered setae on its lower fourth. Sternum VIII small and narrow, concealed by tergum VIII and bearing two short apical setae. Anal tergum (fig. 19) elongated, with an oblique row of five setae, of which the lowest is long and strong, before the stylet; behind this row and above the stylet several setae of which one or two are stout and long. Anal stylet (fig. 19) about four times as long as broad, with subparallel sides, bearing at the apex one long seta, which is accompanied by a very short one. Anal sternum (fig. 19) somewhat triangular, with several long setae near and along its ventral margin. Sensilium of the usual pygiopsyllid type. Bursa copulatrix including its duct very small, of about the length of the appendix of the spermatheca. Spermatheca (fig. 20A, B) with a subglobular reservoir which has a more or less distinct dorsal hump and is striated on the inside; appendix longer than the reservoir, its apical third bent at about a right angle or less.

Length of male, 2.25–2.75 mm.; of female, 3 mm.

Traubia, new genus

Near *Stivalius.* Frons with a distinct tubercle. Pronotal ctenidium present, its spines (except the short lowest one) becoming longer and more sharply pointed towards the ventral end of the row. Antesensilial setae present in both sexes. Movable process of clasper of the male quite different from the ones in the species of *Stivalius.*

Type Species: The new species described below.

This genus is named after Lt. Col. Robert Traub in appreciation of his outstanding work on taxonomy of fleas.

Traubia egregia, new species

Figures 21–32

Types

Holotype male and allotype female, Letterbox Camp, altitude 3600 meters, September, 1938, *ex Neophascogale lorentzi,* collected by W. B. Richardson and L. J. Toxopeus. Holotype and allotype deposited in the collection of the Rijksmuseum van Natuurlijke Historie at Leiden, Holland. Paratypes: One male with same data as holotype and allotype; one female *ex Anisomys imitator,* Moss Forest Camp, altitude 2600

meters, October 23, 1938, collected by L. J. Toxopeus; paratypes deposited in the British Museum collection at Tring.

Diagnosis

Separable from all other species of Pygiopsyllidae, except *Lycopsylla nova* Rothschild, by the presence of a frontal tubercle and by the shape of the pronotal ctenidium; it differs from *Lycopsylla* by having a pronotal ctenidium and antesensilial setae.

Description

Head (fig. 21): The rounded frontoclypeal margin with a distinct tubercle (fig. 21A). The oblique submarginal frontal row consists of seven setae, behind this row is a patch of microsetae; there are several large and small setae on the remainder of the frontal region. Eye well developed but not heavily pigmented. Labial palp consisting of five segments, the last segment slightly more than twice as long as the penultimate one. Along the anterior margin of the antennal fossa a row of small setae, and another along the dorsal margin of the fossa. Postantennal region with three rows of setae.

Thorax (figs. 21 and 22): Pronotum with two rows of setae; pronotal ctenidium consisting of 24 spines in the male, 22 to 23 in the female, the spines, except the short lowest one, becoming longer and more sharply pointed towards the ventral end of the ctenidium. Mesonotum with two distinct rows of setae, in front of which are many small, irregularly placed setae; normally two pseudosetae under its collar near the dorsal margin; mesosternosome with seven or eight setae. Metanotum with four distinct rows of setae; metepisternum and metasternum each with one large seta; metepimeron with about 12 large setae and sometimes some additional very small setae.

Legs: All tibiae with two rows of setae on the outer surface on the posterior half and several minute setae along the anterior margin; no tibial false combs. Length of tarsal segments in microns (petiolate base omitted in the figures in parentheses):

Leg	Tarsal Segments				
	I	II	III	IV	V
Male					
Fore	110	137(113)	91(77)	69(58)	132(127)
Mid	176	157(135)	110(91)	72(61)	154(143)
Hind	402	319(281)	176(157)	116(102)	165(154)
Female					
Fore	110	121(102)	83(72)	66(55)	127(121)
Mid	187	167(140)	104(91)	69(58)	127(121)
Hind	404	313(281)	170(151)	104(94)	162(151)